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Extreme Makeover for Hood Canal Bridge

The Hood Canal Bridge's extreme makeover is moving forward. Every section of the bridge, from the east end to the west, will be improved, upgraded or replaced when the project is complete. The improvements include:

- an entirely new east half floating section
- new approach and transition spans at either end
- a new draw span
- a wider roadway from end to end

The Hood Canal Bridge is an economic lifeline for the people and businesses of the Olympic Peninsula and a gateway for visitors coming to experience the wonders of the region. That's why the Washington State Department of Transportation is carrying out this \$285 million makeover of the bridge. The upgrades will preserve the bridge for decades to come and keep traffic moving.

For more information about the project, visit www.hoodcanalbridge.com or call the toll-free project hotline at 1-877-595-HCB2 (4222).



For the latest project information please visit our website:
www.hoodcanalbridge.com

Detour Map on Page 2! ▶

Olympic Peninsula Travel Advisory

The Hood Canal Bridge will be temporarily closed for two three-day periods in August. If you're planning to travel to or from destinations on the Olympic Peninsula (such as Port Townsend, Sequim, Port Angeles or Olympic National Park) during these closures, save this publication for information about detours, travel times, scheduling tips and other information that will help you reach your destination.

The three-day closure dates are:

CLOSED: Thursday, Aug. 11, 8:00 PM
OPEN: Monday, Aug. 15, 4:00 AM

CLOSED: Sunday, Aug 21, 8:00 PM
OPEN: Thursday, Aug. 25, 4:00 AM

Many people have asked why the closures must take place during the summer tourism season. Construction progress milestones must first be met, and tides and weather conditions, particularly wind and wave conditions, have to be just right in order to accomplish this work. Weather conditions in the Fall are not reliable enough to schedule this work.

Stay up to date on the closures by signing up for the Hood Canal Bridge e-newsletter at www.hoodcanalbridge.com or calling the toll-free project hotline at 1-877-595-HCB2 (4222).

Quick Reference Guide

It's easy to stay informed about the three-day closures.

Hood Canal Bridge Project:
www.hoodcanalbridge.com

Hood Canal Bridge Project Hotline:
1-877-595-HCB2 (4222)

Washington State Ferries:
www.wsdot.wa.gov/ferries

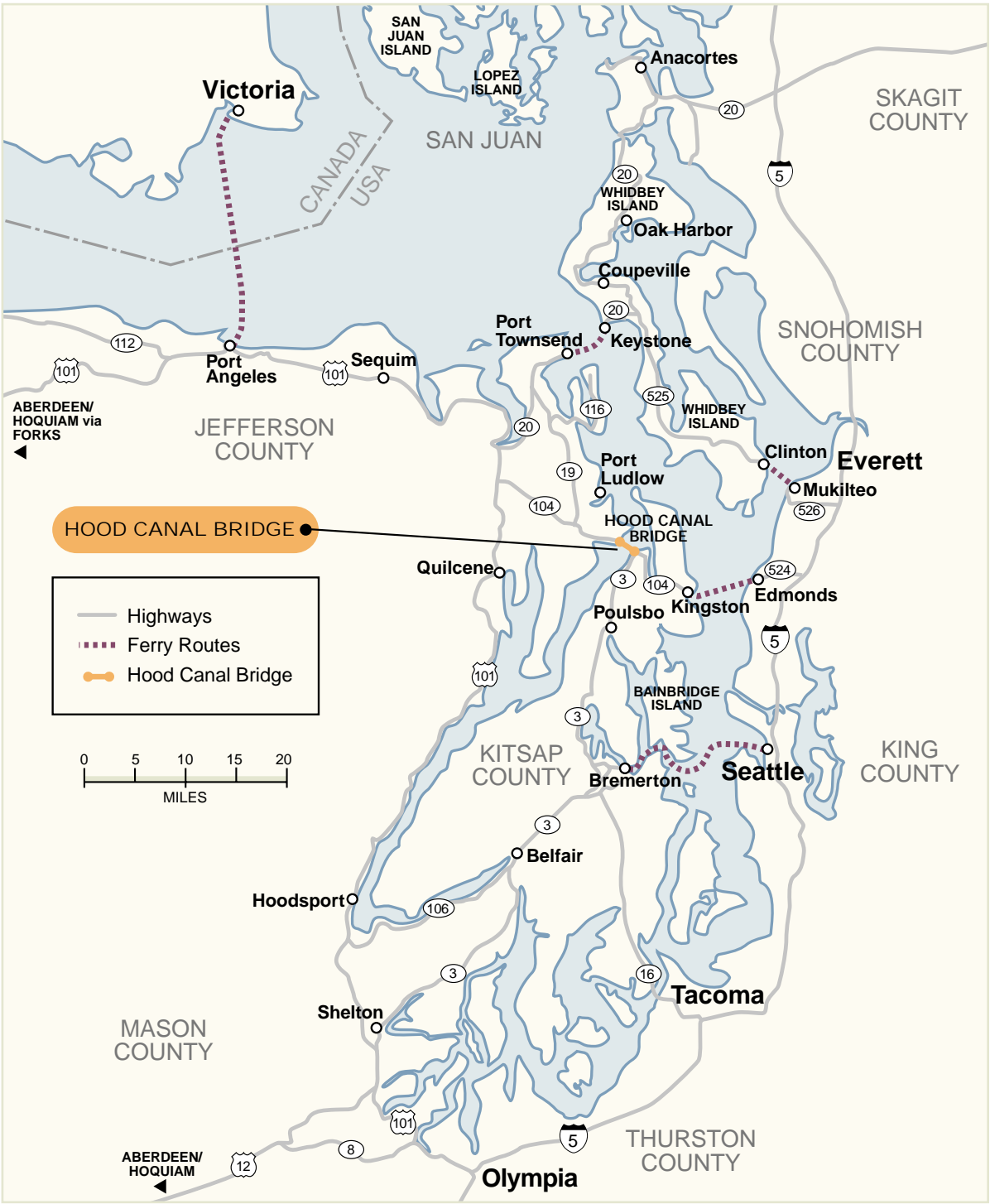
Washington State Ferries Hotline:
1-888-808-7977

Olympic Peninsula Travel and Tourism Info:
www.northwestsecretplaces.com

Jefferson Transit:
www.jeffersontransit.com

Clallam Transit:
www.clallamtransit.com

Kitsap Transit:
www.kitsaptransit.org



Check Your Map, and You're Good to Go!

Worried about the Hood Canal Bridge closure? Relax! There are lots of ways to get to and from the Olympic Peninsula:

If You're Leaving The Olympic Peninsula

If you live or work on the Olympic Peninsula and need to travel during the two three-day closures, the five most direct alternative routes are listed below:

To Olympia: Take US 101 southbound along Hood Canal to Olympia.

To Bremerton & Tacoma: Take US 101 southbound along Hood Canal to SR 3 at Shelton. Take SR 3 northbound through Belfair to its intersection with SR 16 in Bremerton. Take SR 16 eastbound to Tacoma.

To Seattle: Take US 101 southbound along Hood Canal to SR 3 at Shelton. Take SR 3 northbound through Belfair to Bremerton and follow the signs to the Washington State Ferry terminal in downtown Bremerton. Take the Washington State Ferry to Seattle.

To North Puget Sound Area: Take the Washington State Ferry from Port Townsend to Keystone (on Whidbey Island north of Seattle).

To Olympia via Aberdeen/Hoquiam: Take US 101 southbound from Port Angeles to the Aberdeen/Hoquiam area, then head eastward on US 12 to its intersection with SR 8. Follow SR 8 to US 101 and follow US 101 into Olympia.

There are additional, though less direct, routes from the Kitsap and Olympic peninsulas via Washington State Ferries. Visit www.wsdot.wa.gov/ferries for more information. Additionally, commercial ferries, commercial airlines and air charter services provide service to and from the Olympic Peninsula. Visit www.northwestsecretplaces.com for more information.

If You're Visiting The Peninsula

If you are planning to visit the Olympic Peninsula, the five most direct alternative routes to the Olympic Peninsula during the two three-day closures are as follows:

From Olympia: Starting from Olympia, take US 101 northbound along the western shore of Hood Canal.

From Tacoma and Bremerton: Take SR 16 from Tacoma, across the Narrows Bridge, to southbound SR 3 just south of Bremerton. Follow SR 3 to US 101 in Shelton, and follow US 101 northbound.

From Seattle: Take the Washington State Ferry from Seattle to Bremerton, then follow the signs for SR 304 west until the turn off to southbound SR 3 just south of Bremerton. Take SR 3 through Belfair to US 101 at Shelton, and follow US 101 northbound.

From North Puget Sound Area: Take the Washington State Ferry from Keystone (on Whidbey Island north of Seattle) to Port Townsend.

From Olympia via Aberdeen/Hoquiam: Starting from the Aberdeen/Hoquiam area (on the Washington coast east of Olympia), take US 101 northbound. This a longer route that includes the Pacific coastline and parts of Olympic National Park.

There are additional, though less direct, routes to the Kitsap and Olympic peninsulas via Washington State Ferries. Visit www.wsdot.wa.gov/ferries for more information. Commercial ferries, commercial airlines and air charter services also provide service to the Olympic Peninsula. Visit www.northwestsecretplaces.com for more information.

Closure Survival Tips

If you live or work on the Olympic Peninsula:

- Check www.hoodcanalbridge.com frequently to stay up to date on the closure schedule, get detour information and learn more about the project. Sign up for the e-newsletter while you're there.
- Call the toll-free project hotline at 1-877-595-HCB2 (4222) for additional project information.
- Stay close to home. Avoid scheduling appointments that require travel off the Olympic Peninsula during the closures.
- Talk with your employer as soon as possible about how to handle the detour if the bridge is part of your commute or business route.
- Discover the wonders found close to home.
- Share the ride or try transit! The fewer vehicles on the road, the smoother traffic will flow.
- Coordinate with friends, family, and customers who are planning a visit to your home or business around the time of the closures. Direct them to the project website to stay up on the schedule, and make sure they're aware of detour options.
- Allow extra time in your travel schedule if you must leave the peninsula – detour routes will likely be busier than usual.
- Keep an eye out for construction workers in or near the roadway, and Give 'em a Brake.
- Be patient. We're all in this together!



If you're traveling to the Olympic Peninsula as a visitor:

- Check www.hoodcanalbridge.com frequently to stay up to date on the closure schedule, get detour information and learn more about the project. Sign up for the e-newsletter while you're there.
- Call the toll-free project hotline at 1-877-595-HCB2 (4222) for more information on the project.
- No need to reschedule your trip – just allow extra time, and enjoy a route you might not have tried otherwise. There are plenty of alternative ways to get to your destination, so plan ahead.
- Check in with your hosts – most lodging facilities will accommodate late arrivals, particularly during the bridge closures. Be sure to take the phone number for your destination with you so you can call if delayed.
- If you're visiting friends or family, check in with them so they have a sense of your arrival time.
- Keep an eye out for construction workers in or near the roadway, and Give 'em a Brake.
- Stay flexible. Let the journey be part of your experience.

**For project information
call toll-free**

1-877-595-HCB2 (4222)

Hood Canal Bridge Ins and Outs

The Hood Canal Bridge first opened in 1961 and is one of the few floating bridges in the world that span a saltwater tidal basin. Its location has subjected the bridge to daily tidal shifts of as much as 16.5 feet in elevation, high winds, saltwater corrosion and severe weather.

On Feb. 13, 1979, a brutal storm whipped through the area, with wind gusts of 120 mph. The storm, combined with an unusually high tide, ripped out the west half of the Hood Canal Bridge. It took more than two years to replace it, during which time the people of the Olympic Peninsula had to get by with a small car ferry or drive around the canal to reach the urban center of the state. In 1982, the bridge reopened with a brand new west half.

As devastating as losing the west half was, replacing it allowed engineers to incorporate a remarkable new construction innovation – epoxy-coated rebar. Today we take this construction material for granted, but it was revolutionary for its day, and it greatly extended the life expectancy of the new west half. Why? In a saltwater environment, salt eventually works its way into the concrete and begins eating away at the steel rebar. By coating the rebar with epoxy, salt cannot penetrate the steel, allowing the structure to last for decades longer.

Now the original, 44-year-old east half, including the draw span, needs to be replaced. “It’s like owning a ‘61 Impala,” explains WSDOT Olympic Region Communication Manager Lloyd Brown. “It’s a classic, but now it’s hard to find parts and costly to keep it in good repair.”

In addition to replacing the east-half of the bridge, the west-half roadway will be widened to provide safe haven for bicyclists, pedestrians and disabled vehicles. As traffic increases on the bridge, that extra width will be available to expand the roadway to four lanes.

The approach span is connected to the transition span...

Widening the bridge creates its own set of challenges. Understanding how engineers overcame one of the biggest widening challenges – a potential bridge closure of up to a year – requires a bit of a primer regarding the parts of a floating bridge (see the bridge diagram above):

- **APPROACH SPANS:** These segments connect the transition spans to the land.
- **TRANSITION SPANS:** These segments serve as the link between approach spans and the flat, floating portion of the bridge. The transition spans, easily recognized by their steel trusses, are hinged at either end to allow for the rise and fall of the tides.
- **CONCRETE PONTOONS:** The flat, floating portion of the bridge consists of 35 concrete pontoons, held together with permanently set steel cable and anchored in place by massive concrete anchors sunk below the water. The heaviest pontoon weighs over 8,000 tons, but can float in only 17 feet of water.
- **DRAW SPANS:** Located in the middle of the bridge, the draw spans slide open and closed to allow boats, barges and submarines to pass through.

The approach spans are fixed structures (they don’t float), built on concrete piers. The piers extend from 45 to almost 100 feet below the canal floor. In the past,



the way to replace the approach spans would have been to close the bridge, demolish the existing approach spans and build new ones in their place. This process would have taken up to a year to complete. WSDOT engineers wanted to find a way to keep traffic moving to and from the Olympic Peninsula so they figured out better way to replace the approach spans that requires only two three-day closures.

Work trestles and falsework (huge moveable frames or supports similar to scaffolding) have been constructed underneath and beside each approach span. The new approach spans are being constructed on the north side of the existing approach spans. When the new approach spans are ready, the existing ones will be rolled southward onto the temporary falsework, and the new approach spans will be rolled into place. The bridge will be closed to traffic during the two 80-hour periods required to replace the two approach spans.

Once the approach spans are replaced and the west-half roadway is widened, the next step will be to

replace the existing transition spans and east-half draw span and pontoons. The pontoons and draw span will be constructed off site and floated into position. Moving the new segments into place and preparing the finished roadway for traffic will require an eight-week closure (likely to occur in 2009).

The finished product

The new east-half pontoons will be more massive than the existing ones, enabling the bridge to remain open to traffic under stronger winds conditions The wider bridge will better accommodate disabled vehicles, pedestrians and cyclists. The old “bulge” will be removed from the new draw span, making it safer for drivers. Future bridge widening can be completed without having to close the bridge. Most importantly, area residents, commuters, medical patients, freight haulers and visitors will continue to have this vital transportation link that keeps traffic moving to and from the Olympic Peninsula.

Help Keep Traffic Moving

During the bridge closures, there are several ways you can help keep traffic moving:

- Allow extra time for your trip.
- Call ahead to those who are awaiting your arrival so they won't worry, and you won't feel rushed.
- Pay attention to what's happening in front of you.
- Keep some distance between you and the vehicle in front of you in case of sudden stops and to allow safe haven for vehicles that may need to pass you.
- Use the slow-vehicle turnouts if you're holding up traffic (and tip your hat to others for doing the same!).
- Avoid blocking driveways and side streets if traffic does get congested.
- Use care in construction zones – slow down and Give ‘em a Brake.
- Be patient – we’re all in this together!

For the latest project information please visit our website:
www.hoodcanalbridge.com



Did you know

- The Official Name of the Hood Canal Bridge is the William A. Bugge Bridge. The Washington State Transportation Commission voted to name the bridge after Mr. Bugge in 1977. He was the director of the Washington State Department of Highways 1949-1963 and a leader in planning and building the bridge.
- There are 11 permanent floating bridges in the world, four of which are located in Western Washington. Incidentally, the original Lacey V. Murrow Bridge on I-90 in Seattle was the first floating bridge ever built in the world. (It has since been replaced.)
- The Hood Canal Bridge was the second concrete pontoon floating bridge constructed on Washington's highway system. It is one of the world's few floating bridges over a saltwater tidal basin.
- Construction of the State Route (SR) 104 Hood Canal Bridge began January 1958.
- The Hood Canal Bridge opened on August 12, 1961.
- Cost to construct the original bridge was \$26,630,000.
- The west half of the bridge failed and sank on February 13, 1979 during a storm carrying wind gusts of 120 miles per hour and sustained winds of 85 miles per hour. The west half was rebuilt and opened to traffic in October 1982.
- The overall bridge length is 7,869 feet (approximately 1.5 miles). It has a center draw-span opening of 600 feet.
- Average daily traffic across Hood Canal Bridge is approximately 20,000 vehicles. Peak volumes reach 25,000 vehicles on summer weekends.
- The water depth below the floating bridge pontoons ranges from 80 to 340 feet. In its marine environment, the bridge is exposed to tide swings of up to 16.5 feet.
- During severe wind and weather, the draw span is retracted (closing the bridge to vehicle traffic). This allows the bridge to flex and move more, relieving the forces on the bridge from wave action.



How Does A Concrete Bridge Float?

The Washington State Department of Transportation is a pioneer in designing and building floating bridges and holds the record for the first and the longest floating bridges. There are only 11 permanent floating bridges in the world, and four of them are in the Puget Sound region.

So how does concrete float? The same way a boat or a barge does. Anything that weighs less than the total amount of water it displaces will float. A concrete pontoon's weight is very heavy, but its weight is spread out over a very broad area, so it displaces a lot of water. The total amount of water the pontoon displaces weighs more than the pontoon itself, so the pontoon floats.

While a floating bridge might seem pretty exotic, it's really the only cost-effective solution that works for spanning Hood Canal. The bridge is located at one of the narrowest points of the canal, but the channel is still about 1.5 miles wide and up to 340 feet deep (with several hundred of feet of mud below that before hitting bedrock). If a suspension bridge like the Tacoma Narrows Bridge were built here instead of a floating bridge, its towers would have to extend 810 feet high from bedrock (500+ feet below the water surface). That's 205 feet taller than the Space Needle. Total cost would be about \$4 billion – some 14 times the cost of this project.

For the latest project information please visit our website:
www.hoodcanalbridge.com

Tell Us What You Think

Please take a few moments to jot down your ideas and send them on to us. Your feedback will help us better serve you.

1. Was this publication useful to you?

2. How did you obtain a copy?

3. What could WSDOT do to make this publication even more useful?

Please send your comments to WSDOT Hood Canal Bridge Communication Office, P.O. Box 47440, Olympia, WA 98504-7440, or email your comments to Becky Hixson at hixsonb@wsdot.wa.gov.